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Atmospheric Environment

Volume 33, Issue 12
1 June 1999
Pages 1889-1904

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PII: S1352-2310(98)00205-2
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Assessment of environmental tobacco smoke and respirable suspended particle exposures for nonsmokers in Basel by personal monitoring

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Received 15 January 1998; accepted 20 May 1998. Available online 6 December 1999.

Abstract

One hundred and ninety-six randomly selected nonsmoking subjects collected air samples close to their breathing zone by wearing personal monitors for 24 h. The study was centred in Basel, Switzerland, and comprised housewives in one group, primarily for assessing exposures in the home, and office workers in a second group to assess the contribution of the workplace to overall exposure. Samples collected were analysed for respirable suspended particles (RSP), nicotine, 3-ethenylpyridine and environmental tobacco smoke (ETS) particles by using ultraviolet absorbance, fluorescence and solanesol measurements. Saliva cotinine analyses were also undertaken to confirm the nonsmoking status of the subjects. Based upon median 24 h time weighted average concentrations, office workers who live and work with smokers were exposed to 39 μg m^{-3} RSP, 6.6 μg m^{-3} ETS particles and 0.90 μg m^{-3} nicotine. Housewives living with smokers were exposed to median concentrations of 34 μg m^{-3} RSP, 1.4 μg m^{-3} ETS particles and 0.60 μg m^{-3} nicotine. Workplaces where smoking occurred were

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estimated, on average, to contribute between 34 and 46% to annual exposure of ETS particles and nicotine. Based upon 90th percentile values the most highly exposed housewives, those living with smokers, would potentially inhale 18 cigarette equivalents per year whilst the most highly exposed office workers, both living and working with smokers, might inhale 61 cigarette equivalents. The rate at which subjects misreported their nonsmoking status varied between 9.7 and 12.2%.

Author Keywords: Nicotine; Cotinine; Solanesol; Housewives; Workplace

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